

The Common Aviation Command and Control System: Worth the Wait?

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## **Introduction**

Initially scheduled for full operational capability (FOC) in 2008, the Common Aviation Command and Control System's (CAC2S) current FOC target date is unknown<sup>1</sup>. Plagued by recent setbacks, the program has received intense scrutiny with regard to delays and overall viability. Nevertheless, CAC2S developmental delays will be outweighed by the system's benefits: increased expeditionary character, enhanced network capabilities, and improved decision superiority.

## **Background**

CAC2S is designed to support the Marine Corps' "capstone warfighting concept, expeditionary maneuver warfare (EMW)," as well as to ensure success during naval and joint/combined operations across the spectrum of conflict.<sup>2</sup> CAC2S will replace the "current stove-piped systems, organizations, and missions" . . . with "a common, interoperable, accessible, single command and coordination process."<sup>3</sup> The stove-piped systems that CAC2S is designed to replace come from the Direct Air Support Center (DASC), Tactical Air Operations Center (TAOC), and Tactical Air Command Center (TACC).<sup>4</sup> In fact, CAC2S was featured on the Marine Corps' "EMW Capability List," which was issued by the Marine Corps Combat Development Command in June 2003.<sup>5</sup>

However, in May 2008 during an operational assessment, the CAC2S' performance was deemed subpar: the system "consistently experienced network instability, poor reliability, information assurance inadequacies, and overall performance issues."<sup>6</sup> In addition, failures to fulfill initial operational capability (IOC) criteria have occurred.<sup>7</sup>

Consequently, the Marine Corps decided to postpone the awarding of a low rate initial production (LRIP) contract and has decided to restructure the entire CAC2S program.<sup>8</sup> Due to the program's restructuring, new timelines for IOC and FOC are pending until the acquisitions strategy is re-written.<sup>9</sup>

### **Benefits Outweigh Delays**

CAC2S' setbacks have been unfortunate and costly in terms of time, money, and resources. However, the long-term capabilities that CAC2S will bring to the table relative to current Marine Air Command and Control System (MACCS) functionality and equipment are worth the cost and the delay.

#### Increased Expeditionary Character

"CAC2S will be rapidly deployable, employable and sustainable throughout the global operational environment. The logistical footprint will be significantly reduced from the C2 of today's MACCS; as modularity and equipment commonality will

reduce the need for large, dissimilar shelter systems and their accompanying specialized maintenance support.”<sup>10</sup>

A rapidly deployable system will become increasingly important in the uncertain and chaotic future that the Marine Corps will be expected to operate within. Unforeseen threats will require the Marine Corps to respond with little notice to defend the Nation’s interests. CAC2S will be a means for the MACCS to remain aligned with the “force in readiness” concept that has been a Marine Corps hallmark.

In addition, employability and sustainability in “any clime and place” is an absolute necessity. CAC2S’ design goals require the system to withstand the rigors of any physical environment that Marines may find themselves operating within.<sup>11</sup> Once in theater, the system’s lift requirements equate to HMMWVs or HMMWV variants with trailers.<sup>12</sup> This compares favorably to the legacy systems’ lift requirements from mobility and footprint perspectives, particularly for the TACC and TAOC. The TACC and TAOC currently use bulky, 30,000 pound shelters requiring specialized equipment for movement.<sup>13</sup> Overall MACCS mobility will be greatly enhanced by the self-deployable shelters associated with CAC2S. The system is also designed to be air transportable (C-130, C-17, C-5, CH-53E) and sea transportable (LCU, LCAC).<sup>14</sup>

Adaptability is another strong suit of CAC2S. "With its scale-able and modular approach, CAC2S can quickly respond with a wide range of capabilities options in support of any operation, during all phases of operations, and can easily flex and shift to meet varying mission and agency requirements."<sup>15</sup> CAC2S will better enable the MACCS to tailor its capabilities to the mission at hand. Modules can be easily created to enable task-organized nodes to operate. These nodes can vary greatly in size and scope from an air support element with a handful of operators to a full-blown aviation C2 facility in support of a Marine expeditionary force (MEF) level operation.<sup>16</sup>

CAC2S equipment commonality will increase the responsiveness of the MACCS, which is essential in an expeditionary environment. A change in mission or operational need will not require waiting for new equipment to arrive on site. Instead, the common equipment could be used with an altered crew to meet the requirements of the mission. This commonality stands in contrast to the current suite of MACCS equipment: separate equipment performs separate C2 functions such as airspace management, air defense, and air support.<sup>17</sup>

#### Enhanced Network Capabilities

The system will be networked with other Marine air-ground task force (MAGTF) databases and information systems. All CAC2S

workstations, regardless of level, will have access to the same information from a durable and survivable network.<sup>18</sup> This information will be drawn from any sources in theater, as well as sources originating in the United States.<sup>19</sup>

Furthermore, CAC2S will be compatible and share information with joint C2, intelligence, surveillance and reconnaissance systems that are used now or will be used by the Army, Navy, and Air Force. In addition, CAC2S will be compatible and able to share information with allied/coalition systems performing aviation C2 functions similar to those performed by the MACCS.<sup>20</sup> As the Marine Corps finds itself operating in joint and/or coalition environments more frequently, this capability will become increasingly important and relevant. Connectivity with other MAGTF elements and joint and/or coalition partners will facilitate integrated planning and efficient execution.<sup>21</sup> The Marine Corps will also be able to leverage non-organic intelligence, sensor, and C2 assets, enabling it to offset some of the capabilities limitations associated with being the U.S. military's smallest service.<sup>22</sup>

With regard to specific networking capabilities, CAC2S will include voice over internet protocol (VOIP), data transfer, data link compatibility, video streaming, and the ability to network with sensors. The system is designed to facilitate the transfer

of large volumes of data without degraded performance or delays.<sup>23</sup> CAC2S' design will allow this transfer of data with multiple agencies and enhance its ability to "receive, display, manipulate, and disseminate information utilizing one system."<sup>24</sup>

#### Improved Decision Superiority

CAC2S will enhance operational speed and tempo in a variety of ways, namely through decision superiority. Decision superiority is a concept whereby information displays and automated tools are leveraged such that friendly decision making outpaces that of adversaries. The system will be able to project numerous displays<sup>25</sup> tailored to the needs of the commander and other key decision-makers. These displays will project information on a near real-time basis. Examples include the common tactical picture (CTP) and the common operational picture (COP).<sup>26</sup> The enhanced situational awareness created by these displays will contribute to timely and accurate decision-making.

Automated planning tools are another strong suit of CAC2S. These planning tools will assist with "airspace de-confliction, line of sight determination, aircraft routing, and air defense scenarios."<sup>27</sup> The legacy MACCS systems do not provide this capability. Instead, planners within the MACCS agencies conduct this planning manually when preparing for an operation or



contingency. Automated tools will prove highly beneficial in the expedient and precise planning of MACCS functions. The ability to ensure aircraft safety of flight, proper communications equipment placement, and appropriate responses to enemy air threats will be greatly enhanced.

After the planning phase, CAC2S will offer a number of situational decision aids to be leveraged in theater. Examples of these automated decision aids include the following: allocation of aviation assets, tracking of air support missions, and aircraft routing.<sup>28</sup> An automated aviation asset allocation tool would speed operator decision-making during time-sensitive situations, such as troops in contact (TIC). This tool will also ensure the proper allocation of aircraft platforms and weapons-to-target match in response to the enemy threat. In addition, an automated air support mission tracker will improve priority of work procedures and ensure that critical air support requests receive due attention.

Lastly, automated aircraft routing tools would "assist the operator in the determination of the safest and shortest aircraft routes, including low level transit routes."<sup>29</sup> Safe routing helps prevent aviation mishaps and is a critical function provided by the MACCS. Automation will be particularly important in a congested airspace environment, when an operator

can quickly become overwhelmed. Efficient routing equates to shorter aircraft transit times. Shorter transit times equate to more responsive CAS or assault support for ground forces.

### **Counter-Arguments**

Critics of CAC2S may be quick to point out that the Marine Corps made a mistake by developing CAC2S in-house as opposed to identifying a joint solution. Due to its small size, the Marine Corps has less money and fewer resources to devote to acquisitions. As a result, some of the problems with the program's ability to meet cost, schedule and performance requirements<sup>30</sup> can be attributed to an acquisitions program that is under-funded and under-staffed.

However, the Marine Corps simply did not have the option of pursuing a joint solution. Other services, such as the Air Force, still utilize the "stove-piped" model of aviation C2 systems that the Marine Corps is attempting to gravitate away from.<sup>31</sup> Therefore, the Marine Corps is attempting to find an innovative solution to anticipated twenty-first century problems.

Another critique of CAC2S is that it is fixing a system that is not broken. While the legacy systems have performed well in the past, there is room for improvement. In addition to

the benefits listed above, CAC2S will provide improvements via its open architecture design and information assurance controls. CAC2S' open architecture design will stand in stark contrast to the closed, proprietary design of the legacy systems. The open architecture methodology will allow the Marine Corps to integrate changes, upgrades, or capabilities more rapidly as they become available in the marketplace. With closed systems, the Marine Corps would be tethered to the original vendor, causing upgrades to be more costly and time consuming to implement. Separately, the legacy systems are characterized by a complete lack of information assurance (IA) controls. This vulnerability will be minimized with CAC2S as IA controls are addressed during the design phase.<sup>32</sup>

As a consequence, CAC2S will provide a better overall solution to the complex future operating environments that Marine Corps will be expected to operate within. The increased level of automation will better enable the MACCS to function in an increasingly information-intensive world. The adaptability afforded by CAC2S will allow the MACCS to support the MAGTF across the spectrum of operations. The interoperability of the system will ensure the MACCS can integrate with joint and coalition partners.

## **Conclusion**

The CAC2S program has been characterized by short-term costs and setbacks that will ultimately be outweighed by long-term gains. These gains take the form of enhanced capabilities that will allow the MACCS to operate more effectively in expeditionary environments, integrate with joint and coalition partners to higher degrees, and to enable more accurate and timely decisions.

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## Endnotes

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